SUBJECT: **INFORMATION:** Plastic Pipe

FROM: Cesar De Leon
Director, Regulatory Programs, DPS-10

TO: Richard E. Sanders
Manager, Pipeline Safety Division, DMA-607

This memo responds to your list of concerns, dated November 16, 1991, about plastic pipe, stemming from discussions at TSI seminars, pipeline safety inspections, and pipeline accidents.

1. Section 1, issue 1, (Present Part 192 Code Sections ... Where Temperatures Will Not Go Below -20❍F or Above 140❍F) and Section 6, (Pressure Testing of Polyethylene Systems), of your memo expressed concerns over existing temperature limits for design and testing of plastic pipe. As you know, 49 CFR 192.123, Design limitations for plastic pipe, sets a minimum operating temperature in plastic pipe at -20❍F, and 49 CFR 192.513 limits the temperature of thermoplastic material during pipeline tests to a maximum of 100❍F.

   We agree with your recommendations concerning the need to relax the regulations to reflect advancements in technology of polyethylene piping. We are currently developing a Notice of Proposed Rulemaking to address these issues.

2. Section 1, issue 2, expressed a concern over the need to derate plastic pipe whose temperature exceeds 73❍F to be commensurate with the design formula for that temperature. We agree that unless the pipe in your example was qualified for use above 73❍F, its MAOP could not be set at 60 psig.

3. In Section 2, (Qualification Procedures in §192.283), you expressed concern over §192.283(a)(1)(i) which governs the qualification of procedures of joining polyethylene pipe. This section references ASTM D2513, 1987 edition, which does not identify fiber stress amounts for polyethylene pipe when conducting an acceptable quick burst test.

   We intend to address this issue through staff participation on the ASTM D2513 committee. Meanwhile, we have issued an interpretation on the issue. (See attached letter to Glen Smith.)

   Additionally, in Section 2, you recommended that an organization, such as PPI, undertake responsibility for receiving and reviewing all joining procedures, and publishing all

qualified joining procedures. Although we see some potential benefit to such action, we do not think it's necessary for RSPA to take the lead in bringing it about.

4. In Section 3, (Maintenance of Equipment Used to Join Plastic Pipe), you identified the need for equipment specifications and maintenance requirements regarding permissible tolerances in the operation of equipment used to join plastic pipe.

   We agree with your concerns about the use of proper equipment, However, we think a requirement to use such equipment is implicit in existing standards under §192.273 and §192.283, which govern plastic pipe joining. Equipment that is in obviously poor condition probably would not be able to produce the requisite joints.

5. Section 4, (Qualification Of Persons To Join Plastic Pipe), expressed the need for clarification of 49 CFR 192.285(c). This rule requires persons to be requalified if, during any 12 month period, (1) the person does not make any joints under a given procedure; or (2) 3 joints or 3 percent of the joints made, whichever is greater, are found unacceptable by testing under §192.513.

   Upon review of this regulation, we find that it does not require am operator to review a person's joining performance based on a running 12-month period. In other words, each new day does not mark the end of another 12-month period requiring another review. Rather, in cases where a person is qualified or requalified to join plastic pipe, the 12-month period would begin at the time of the qualification.

6. In Section 5, (NFPA Standard 58), you indicated that there sometimes arises confusion over which requirements take precedence, NFPA 58 or the Part 192 regulations. You said the NFPA code, referenced in §192.11, permits only butt or socket fusion for polyethylene pipe; whereas, the Part 192 regulations, otherwise, permit mechanical fittings.

   NFPA 58 expressly prohibits the use of mechanical fittings on certain pipe in petroleum gas systems. The use of mechanical fittings on all gas systems is allowed under Subpart F, "Joining of Material Other Than by Welding." We are aware that some operators view this as a conflict. Thus, we are presently evaluating the issue as part of our regulatory review process and hope the review will resolve this matter.

   Lastly, you indicated that NFPA requires all plastic materials used in LP gas systems to be registered with NFPA. A review of the 1979 edition of NFPA 58, adopted by our regulations, and our subsequent conversations with NFPA, regarding interpretation, confirm your assertions. At present, this NFPA requirement cannot be satisfied because there exists no listed authorities for use of polyethylene plastic pipe. Consequently, NFPA has amended the standard to eliminate this requirement from the 1992 edition of NFPA

58, and we have begun efforts within DOT to reference this latter edition in our regulations.

7. Section 7, Plastic Casings, raises a concern over the use of plastic casings with steel carrier pipe. The plastic casing would act as a high dielectric material, thus not permitting cathodic protection currents to be driven through the casing to the carrier pipe.

   If a pipeline does not have an adequate level of cathodic protection because of shielding by a pipe casing, the operator must remove the casing or modify the cathodic protection system to provide the required level of protection. We believe this interpretation is clear under the Part 192 corrosion control rules.

8. Section 8, Use of Plastic Pipe for Temporary Bypass During Emergencies and Maintenance, expressed concerns over existing regulations (§192.321) which prohibit the use of aboveground plastic pipelines. The regulations prohibit the use of aboveground plastic pipelines for any reason, including temporary applications needed for quick responses to emergencies and maintenance problems.

   We agree with your concerns, and we are currently developing a Notice of Proposed Rulemaking to address this issue.

9. Section 9, Material Not Covered Under Present DOT Code or Industry Standards, indicated that no industry standards exist for nylon or composite plastic materials. You suggested that standards or procedures be established which would parallel existing standards or procedures for other plastic material.

   As you know, Subpart B-Materials of Part 192 of the DOT Pipeline Safety Regulations prescribes minimum requirements for the selection and qualification of pipes used in natural gas pipelines. It requires that all pipe be manufactured in accordance with a listed specification. For plastic pipe, ASTM D2513 and ASTM D2517 are two such listed standards for manufacture and use of thermoplastic and thermosetting plastic pipe in federally regulated gas pipelines. No other standards are listed for plastic pipe use, and neither ASTM D2513 nor ASTM D2517 incorporate nylon or composite plastics into the standards. Thus, nylon or composite plastic pipe may not be used in federally regulated gas pipelines. We assume, however, that standards comparable to thermoplastic and thermosetting materials will be developed with sufficient economic or industrial demand. We would then consider amending Part 192 to reflect these changes.

Your continued support for this office is very much appreciated.

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Attachment

Mr. Glen D. Smith
Chief, Pipeline Safety Utilities Division
Kansas Corporation Commission
1500 S.W. Arrowhead Rd.
Topeka, KS 66604-4027

Dear Mr. Smith:

I am responding to your letter of May 16, 1991, to Mr. George Tenley, regarding the requirements of 49 CFR 192.283(a)(1)(i) for testing a procedure used to join polyethylene pipe by fusion. These requirements refer to paragraph 8.7, Minimum Hydrostatic Burst Pressure, of ASTM D2513 (1987 edition). You questioned the applicability of paragraph 8.7 to polyethylene because paragraph 8.7 does not provide a test pressure for this material or a fiber stress for calculation of a test pressure.

Although your observations about paragraph 8.7 are correct, ASTM D2513 (1987 edition) provides another means for qualifying polyethylene pipe that is tested under paragraph 8.7. Paragraph 6.3 of ASTM D2513 (1987 edition) provides:

> For PE materials, the pipe shall fail as defined in D1599. In addition, the pipe shall fail in a ductile manner, when tested in accordance with 8.7.

So, if polyethylene pipe specimens with fusion joints are tested under paragraph 8.7, and the specimens fail as defined in ASTM D1599 and in a ductile manner, the fusion joining procedure qualifies under §192.283(a)(1)(i).

We will be amending the ASTM D2513 references in Part 192 to reflect the changes in the 1991a edition of ASTM D2513. In the 1991a edition, paragraph 6.7 and Annex A1 include the above ASTM requirements regarding minimum hydrostatic burst pressure for testing polyethylene pipe specimens. We will amend §192.283(a)(1)(i) to reflect this change in the 1991a edition of ASTM D2513.

Sincerely,

/signed/

Cesar De Leon
Director, Regulatory Programs
Office of Pipeline Safety

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